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COMMENTS ON THE BACILLARIOPHYCEAE OF NORTH CENTRAL ARKANSAS

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While studying certain ecological aspects of Diatoms near Franklin, Arkansas, as the basis of a master's thesis, some further data deemed worthy of publication were assembled.

Two ponds, which are located within the corporate limits of Franklin, Izard County, were studied to ascertain the effect of various environmental factors upon the periodicity of their diatom flora. In the course of the taxonomic determinations for an ecological appraisal, the following genera and species were encountered.

Brebissonia Boeckii (Ehr.) Grun.
Cocconeis pediculus Ehr.
Coscinodiscus subtilis Ehr.
Cymbella amphicephala Naeg.
Cymbella leptoceras (Ehr.) Rabenh.
Cymbella pusilla Grun.
Cystopleura gibba (Ehr.) Kuntze.
Frustulia viridula (Breb.) DeToni.
Gomphonema acuminatum. Ehr.
Gomphonema gracile Ehr.
Gomphonema montanum Schum.
Gyrosigma spencerii (W. Sm.) Cl.
Hantzschia amphioxys (Ehr.) Grun.
Meridion constrictum Ralfs.
Navicula ambigua Ehr.
Navicula brebisonii Kutz.
Navicula gracilis Kutz.
Navicula parva (Ehr.) Elmore.
Navicula rostrata Ehr.
Navicula subcapitata (Greg.) Ralfs.
Pinnularia viridis (Nitsch.) Ehr.
Sceptroneis pacifica (Grun.) Elmore
Synedra pulchella Kutz.
Synedra tenuissima Kutz.
Synedra ulna (Nitz.) Ehr.

This list is not arranged according to the particular pond in which each genus was found, for many were common to both.

It was found that of the four factors studied (pH, water level, water temperature, and turbidity) diatom periodicity was most affected by the water level of the habitats. A rise in water level was followed by an increase in the abundance of diatoms. This apparently was caused by the increase in nutrients washed into the ponds by rainfall, which raised their respective water levels. This supports Pearsall's theory (2) that diatom periodicity is largely the result of floods and rains adding nitrates, silica, and oxygen to habitats in dissolved form. It also was found that one pond, which possessed higher alkalinity, had a greater diatom flora than the other, which was more acid.

The original study, which formed the basis of this paper, was of necessity brief. But the implications are of infinite extent. Conger (3) has most clearly shown the fundamental role of diatoms in the hierarchy of life forms in any particular aquatic habitat. Diatoms are basic in the food supply, directly or indirectly, of all forms of aquatic animal life. Many times, too, they seriously affect the oxygen supply of a given body of water, according to Conger.

In view of the foregoing paragraph, one can see that additional study of these organisms may reveal information of extreme practical value. How do these organisms, for example, affect the supply of fish in the natural and artificial

lakes of Arkansas? The value of the tourist trade attracted by these lakes certainly should lend weight to additional consideration of the Bacillariophyceae. The commerical production of fish is also involved. Trout farms in North Arkansas have great potentialities for development. What role do the diatoms play here? The commercial production of other types of fish conceivably could open up new economic vistas for Arkansas if more were known about the relationship of the Bacillariophyceae to the various environments or ecological conditions found in all areas of the state.

The individual organisms which compose the Bacillariophyceae are small: but so are atoms. We have learned correctly to estimate the potentialities of the latter. Why underestimate the potentialities of the former?

References

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3. Conger, Paul S. *Diatoms: their most important role.* volume LXXIII, Sci. Monthly, pages 315-323; 1951.